AMENDMENTS TO THE CLAIMS

1-19. **(Canceled)**

20. **(Currently Amended)** A method for restoring cellular phenotype in a subject's cell affected by disease, damage, or age, comprising administering to the subject an effective amount of a morphogen to activate an intracellular pathway that induces intracellular formation of a Smad complex which induces expression of a phenotype-specific gene, wherein the pathway is a pathway activated by specific binding of a morphogen to its transmembrane receptor,

wherein the Smad complex comprises a Smad selected from the group consisting of Smad1, Smad2, Smad3, Smad4, Smad5, and Smad8,

wherein the morphogen:

(1) has at least 60% amino acid sequence identity with the C-terminal seven cysteine domain of human OP-1 (amino acid residues 330-431 of SEQ ID NO:8);

(2) has at least 70% amino acid sequence homology with the C-terminal seven cysteine domain of human OP-1 (amino acid residues 330-431 of SEQ ID NO:8); or

(3) is selected from the group consisting of OP-1, OP-2, OP-3, BMP-2, BMP-3, BMP-3b, BMP-4, BMP-5, BMP-9, BMP-10, BMP-11, BMP-12, BMP-13, BMP-15, DPP, Vgl, Vgr-1, GDF-1, GDF-2, GDF-3, GDF-5, GDF-6, GDF-7, GDF-8, GDF-9, GDF-10, GDF-11, GDF-12, 60A, NODAL, UNIVEN, SCREW, ADMP, and NEURAL; and

wherein the cell is a lung cell, a heart cell, a blood vessel cell, a stomach cell, a muscle cell, a renal cell or an intestinal cell[,] and

wherein the morphogen

(a) stimulates endochondral bone formation in an in vivo bone assay; or

(b) stimulates N-CAM or L1 isoform production in an NG108-15 neuronal cell line; or

(c) both,

thereby restoring the cellular phenotype in the subject's cell.

21. **(Canceled)**

22. **(Previously Presented)** The method of claim 20, wherein the Smad complex comprises Smad1 and Smad4.

23. **(Previously Presented)** The method of claim 20, wherein the inducing step comprises phosphorylation of a Smad protein.

24. **(Previously Presented)** The method of claim 20, further comprising inducing translocation of the Smad complex into the cell's nucleus.

25-30. **(Canceled)**

31. **(Currently Amended)** A method for restoring cellular phenotype in a cell affected by disease, damage, or age, comprising contacting the cell with an effective amount of a morphogen to activate an intracellular pathway that induces intracellular formation of a Smad complex which induces expression of a phenotype-specific gene,

wherein the pathway is a pathway activated by specific binding of a morphogen to its transmembrane receptor,

wherein the Smad complex comprises a Smad selected from the group consisting of Smad1, Smad2, Smad3, Smad4, Smad5, and Smad8,

wherein the morphogen:

(1) has at least 60% amino acid sequence identity with the C-terminal seven cysteine domain of human OP-1 (amino acid residues 330-431 of SEQ ID NO:8);

(2) has at least 70% amino acid sequence homology with the C-terminal seven cysteine domain of human OP-1 (amino acid residues 330-431 of SEQ ID NO:8); or

(3) is selected from the group consisting of OP-1, OP-2, OP-3, BMP-2, BMP-3, BMP-3b, BMP-4, BMP-5, BMP-9, BMP-10, BMP-11, BMP-12, BMP-13, BMP-15, DPP, Vgl, Vgr-1, GDF-1, GDF-2, GDF-3, GDF-5, GDF-6, GDF-7, GDF-8, GDF-9, GDF-10, GDF-11, GDF-12, 60A, NODAL, UNIVEN, SCREW, ADMP, and NEURAL; and

wherein the cell is a lung cell, a heart cell, a blood vessel cell, a stomach cell, a muscle cell,-a renal cell or an intestinal cell[,]; and

wherein the morphogen

(a) stimulates endochondral bone formation in an in vivo bone assay; or

(b) stimulates N-CAM or L1 isoform production in an NG108-15 neuronal cell line; or

(c) both,

thereby restoring the cellular phenotype in the cell.

32-38. **(Canceled)**

39. **(New)** The method of claim 20, wherein the morphogen is OP-1.